

Notice of Allowability	Application No.	Applicant(s)	
	10/608,921	LU ET AL.	
	Examiner	Art Unit	
	Lynne A. Gurley	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the application filed 6/27/03.
2. ☒ The allowed claim(s) is/are 1-30.
3. ☒ The drawings filed on 14 October 2003 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

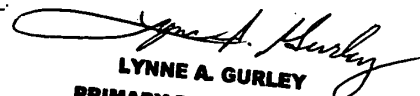
* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>10/14/03</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |


LYNNE A. GURLEY
PRIMARY PATENT EXAMINER
TC 2800, AU 2812

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows to clarify a typographical error (in accordance with the specification, page 7, line 22 (last line of the page)):

In claim 9, line 1, "n > 25" has been replaced by "n < 25";

In claim 19, line 1, "n > 25" has been replaced by "n < 25";

In claim 27, line 1, "n > 25" has been replaced by "n < 25".

Reasons For Allowance

2. The following is an examiner's statement of reasons for allowance: The prior art of record fails to teach or to suggest, either alone or in combination, the steps of the claimed invention, especially the steps of:
3. "exposing said semiconductor wafer to a H-S-R solution to form a S-R layer over said copper interconnects; and depositing a layer of dielectric material over said semiconductor wafer after removing said S-R layer with an in-situ plasma pretreatment of said semiconductor wafer with a hydrogen containing plasma." (claim 1)
4. "forming a S-R layer over said copper interconnects by polishing a copper interconnect layer with a slurry that includes H-S-R; exposing said semiconductor wafer to a H-S-R solution; and depositing a layer of dielectric material over said semiconductor wafer after removing said

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S-R layer with an in-situ plasma pretreatment of said semiconductor wafer with a hydrogen containing plasma.” (claim 11)

5. “forming said copper interconnects by polishing a copper interconnect layer with a slurry that includes H-S-R, said polishing step also forming a S-R layer over said copper interconnects; and depositing a layer of dielectric material over said semiconductor wafer after removing said S-R layer with an in-situ plasma pretreatment of said semiconductor wafer with a hydrogen containing plasma.” (claim 21)

6. “forming said copper interconnects by polishing a copper interconnect layer with a slurry that includes $\text{HSC}_{16}\text{H}_{33}$, said polishing step also forming a S-R monolayer over said copper interconnects; dipping said semiconductor wafer in a solution containing $\text{HSC}_{16}\text{H}_{33}$, said dipping step performed in-situ with said cleaning step; and depositing a layer of dielectric material over said semiconductor wafer after removing said S-R monolayer with an in-situ plasma pretreatment of said semiconductor wafer with a NH_3 plasma.” (claim 21)

7. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne A. Gurley whose telephone number is 571-272-1670. The examiner can normally be reached on M-F 7:30-4:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 571-272-1679. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Lynne A. Gurley
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LAG
June 8, 2004